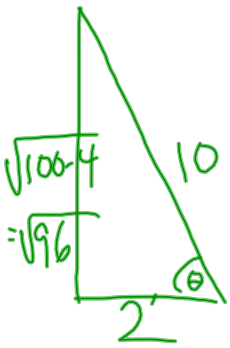
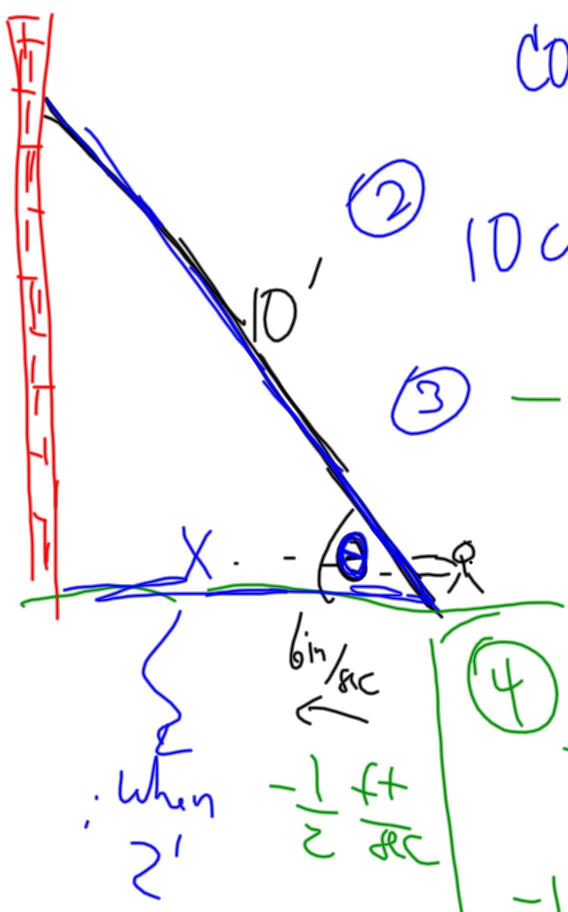
94	60	49
90	58	48
88	56	47
83	55	43
81	52	42
79	51	42
78	50	40
70	50	39
70	49	37
		37
		37
		35
		31
		29

3.7/18



$\sin\theta = \dfrac{\sqrt{96}}{10}$



$\cos\theta = \dfrac{x}{10}$

(2) $10\cos\theta = x$

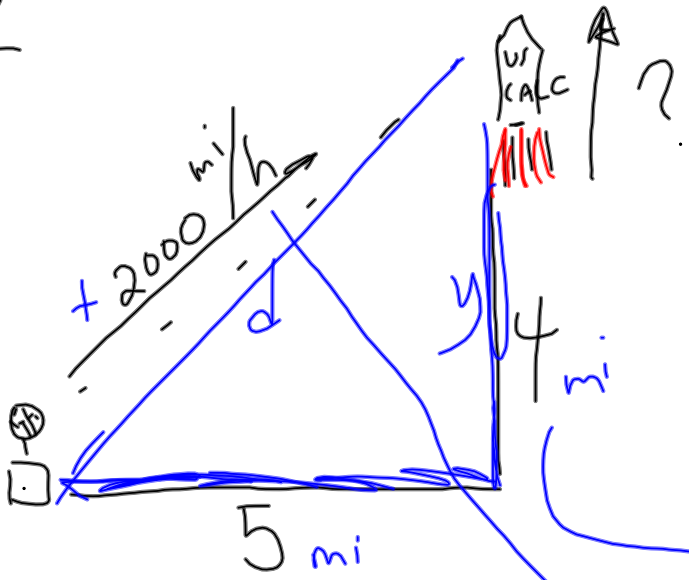
(3) $-10\sin\theta \dfrac{d\theta}{dt} = \dfrac{dx}{dt}$

(4) $-10\sin\theta \dfrac{d\theta}{dt} = -\dfrac{1}{2}$

$-10\left(\dfrac{\sqrt{96}}{10}\right)\dfrac{d\theta}{dt} = -\dfrac{1}{2}$

$\dfrac{d\theta}{dt} = \dfrac{1}{2\sqrt{96}}$ $\dfrac{\text{radians}}{\text{sec}}$

3.7/20



② $d^2 = y^2 + 25$

③ $2d\frac{dd}{dt} = 2y\frac{dy}{dt}$ or $d\frac{dd}{dt} = y\frac{dy}{dt}$

④ $\sqrt{41}\,(2000) = 4\left(\frac{dy}{dt}\right)$

$500\sqrt{41}\ \frac{mi}{h} = \frac{dy}{dt}$

5.4/11 $s(t) = t^3 - 6t^2, \ t \geq 0$

ⓐ $\begin{cases} v(t) = s'(t) = 3t^2 - 12t \\ a(t) = v'(t) = s''(t) = 6t - 12 \end{cases}$

b) $s(1) = 1^3 - 6(1)^2 = -5$ ft

$v(1) = 3(1)^2 - 12(1) = -9$ ft/sec

speed(1) $= |v(1)| = +9$ ft/sec

$a(1) = 6(1) - 12 = -6$ ft/sec²

c) $v(t) = 0$ indicates particle stopped

$3t^2 - 12t = 0$

$3t(t-4) = 0$

$\therefore t = 0, 4$ is when the thing is stopped

ⓓ sign chart $v(t)$

| - - - | + + + |
0 1 4

sign chart of $a(t)$ $6t-12$

- - - | + + +
2

$0 \to 2$ $v < 0$, $a < 0$

$2 - 4$ $v < 0$, $a > 0$

4 on $v > 0$, $a > 0$

speeding up: $(0,2) \cup (4, \infty)$

slowing dn: $(2, 4)$

e) how far did I go $0 \to 5$ sec

$t=4$ GO

-32 $t=5$ 0

$s(0) = 0$

$s(4) = 4^3 - 6(4^2) = 4^2(4-6) = -32$

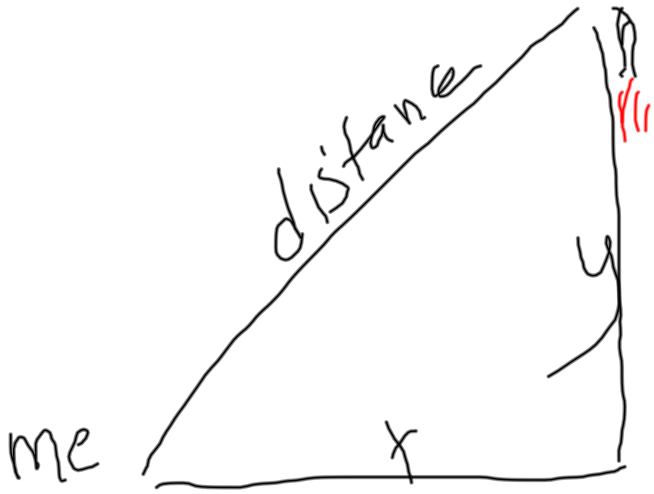
distance travelled $= 32$ ft

$s(5) = 5^3 - 6(5^2) = 5^2(5-6) = -25$

distance travelled $4 \to 5$ sec $= |-32 - -25| = 7$ ft

total distance

$32 + 7 =$


distance
me
x
y
h


vert
horiz

distance travelled is LONG

displacement might not be.

future learning

$\int_a^b f(x)\,dx$ gives us a way to add up an infinite # of function pts.

total change from a to b $= \int_a^b f'(x)\,dx$

distance $= \int_a^b |f'(x)|\,dx$

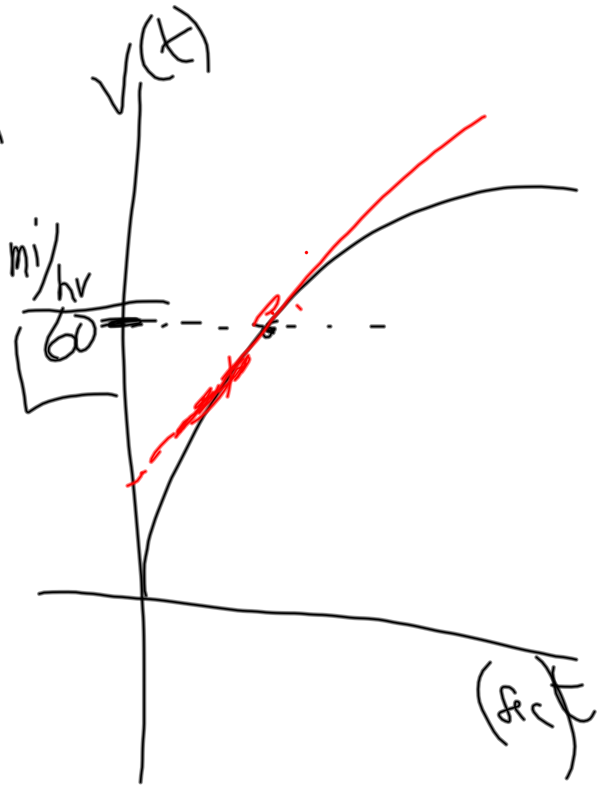
displacement $= \int_a^b f'(x)\,dx$

HW) 5.5/1, 3, 8, 14, 18, 19

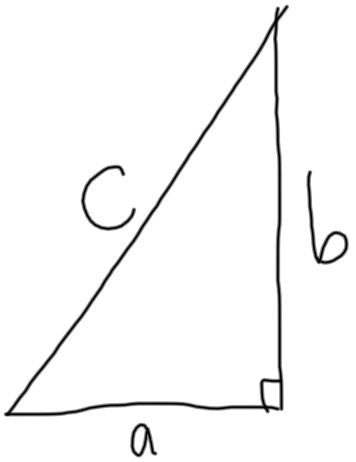
5.4/25-27

read 5.6

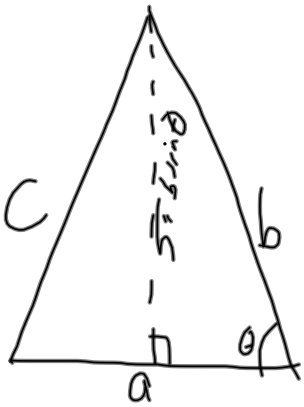
5.4/9



$$\square \; \frac{\frac{mi}{hr}}{sec} \cdot \frac{1hr}{3600sec} \cdot \frac{5280}{1mi}$$



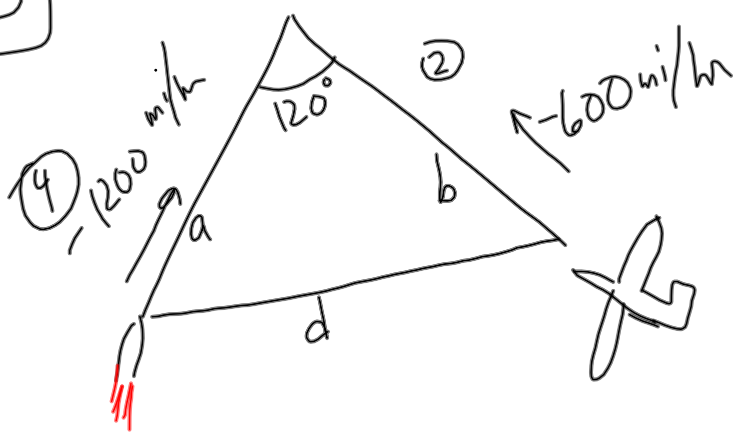
$$c^2 = a^2 + b^2$$



$$\frac{h}{b} = \sin\theta$$

$$h = b\sin\theta$$

37/35



$$d^2 = a^2 + b^2 - 2ab\cos\theta$$

$$d^2 = a^2 + b^2 - 2ab\cos(120°)$$

$d^2 = 4^2 + 2^2 - 2(4)(2)\left(-\frac{\cancel{\sqrt{3}}}{2}\right)$

$d^2 = 20 + 8\cancel{\sqrt{3}} = \cancel{2}8$

$$d^2 = a^2 + b^2 - 2ab\left(-\frac{\cancel{\sqrt{3}}}{2}\right)$$

$$d^2 = a^2 + b^2 + ab\sqrt{3}$$

②

$\cancel{d^2} = 28$

$d = \sqrt{28}$

$= 2\sqrt{7}$

$$2d\frac{dd}{dt} = 2a\frac{da}{dt} + 2b\frac{db}{dt} + \sqrt{3}\left(\frac{da}{dt}b + a\frac{db}{dt}\right)$$

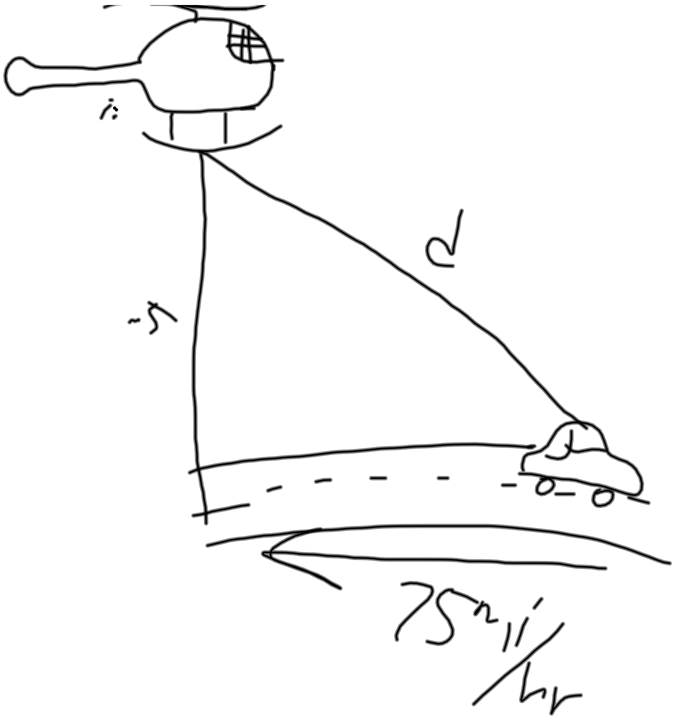
$$2\underset{3}{d}\frac{dd}{dt}? = 2(4)(-1200) + 2(2)(-600)$$

$$+\cancel{\sqrt{3}}(-1200 \cdot 2 + -600 \cdot 4)$$

$$2(2\sqrt{7})\frac{dd}{dt} = -9600 - 2400 - 4800$$

$$= -16800$$

$$\frac{dd}{dt} = \frac{-4200}{\sqrt{7}} = -600\sqrt{7}$$


d
75 mi/hr